UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,365	03/30/2004	James Edward Simpson	140163-1/YOD GERD:0104	4687

7590 03/23/2005

Patrick S. Yoder
FLETCHER YODER
P.O. Box 692289
Houston, TX 77269-2289

EXAMINER	
SONG, HOON K	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/813,365	SIMPSON ET AL.	
	Examiner	Art Unit	
	Hoon Song	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/30/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Carlson et al. (US 4577340).

Regarding claim 14, Carlson teaches an anode assembly, comprising:

a target (43) for emitting X-rays upon irradiation with an electron beam (20);

a rotor shaft (44) coupled to a motor rotor system (100) and the target (43), the rotor shaft (44) configured to rotate the target (43); and

a bearing system (78, figure 1) comprising at least two duplex bearing assemblies supporting the rotor shaft (figure 1).

Regarding claim 15, Carlson teaches a fixed stem (50).

Regarding claim 16, Carlson teaches the rotor shaft (44) is coupled with the fixed stem (50) via the at least two duplex bearing assemblies (78).

Regarding claim 17, Carlson teaches the at least two duplex bearing assemblies allows load to be distributed substantially evenly (figure 1).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 19 and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by McCarthy, JR. (US2004/0109538A1).

Regarding claim 19, McCarthy teaches a method for CT imaging, the method comprising:

rotating a gantry (12) about a subject (20) at three rotations per second or faster (paragraph 0027, line 8-10);

emitting X-rays from an X-ray tube (18) mounted on the gantry (12); and

generating one or more images of the subject based upon the attenuation of the emitted X-rays by the subject (CT imaging, figure 1).

Regarding claim 21, McCarthy teaches a CT system, comprising:

means for rotating a gantry (12) about a subject (20) at three rotations per second or faster (paragraph 0027, line 8-10);

means for emitting X-rays from an X-ray tube (18) mounted on the gantry; and

means for generating one or more images of the subject based upon the attenuation of the emitted X-rays by the subject (CT imaging, figure 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over McCarthy.

Regarding claim 20, McCarthy fails to teach a method of rotating the gantry comprises rotating the gantry at approximately five rotations per second.

However it would have been obvious to one of ordinary skill in the art at the time of the invention to rotate the gantry of McCarthy at approximately five rotations per seconds, since the faster rotational speed of the gantry would reduce scanning time.

Claims 1-2 and 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson et al. (US 4577340) in view of Chidester (US 6819741B2).

Regarding claim 1, Carlson teaches an X-ray tube, comprising:

an anode assembly (figure 1), comprising:

a target (43) for emitting X-rays upon irradiation with an electron beam (20),

a rotor shaft (44) coupled to a motor rotor system and the target (43), the rotor shaft (44) configured to rotate the target (43), and

a bearing system (78) comprising at least two duplex bearing assemblies supporting the rotor shaft (figure 1); and

a cathode (20) assembly, comprising:

a cathode (20) configured to emit the electron beam,

But Carlson fails to teach the cathode has an insulator isolating the cathode from ground potential (figure 1).

Chidester teaches an x-ray cathode insulator (40 or 70).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the x-ray tube of Carlson with the cathode insulator as taught by Chidester, since the insulator would reduce in voltage from the high voltage present at the anode and/or cathode to the much lower housing or ground potential (column 2 line 25-27).

Regarding claim 2, Chidester teaches the insulator comprises a conical insulator (40).

Regarding claim 4, Carlson as modified by Chidester teaches the insulator is offset in a radial direction to the motor rotor system.

Regarding claim 5, Carlson teaches the at least two duplex bearing assemblies distribute load substantially evenly (figure 1).

Claims 1, 3, 7-12, 14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson et al. (US 5978447) in view of Chidester and Carlson et al. (US 4577340).

Regarding claims 1, 7, 14, Carson ('447) teaches a CT system, comprising:

a gantry (16) adapted to rotate about a volume;

an X-ray tube (12) mounted on the gantry, the X-ray tube, comprising:

an anode assembly (figure 2), comprising:

a target for emitting X-rays upon irradiation with an electron beam (62),

a rotor shaft (75, 70) coupled to a motor rotor system (80) and the target, the rotor shaft (75, 70) configured to rotate the target (55), and

a bearing system (78) comprising at least two bearings (90a, 90b) supporting the rotor shaft (figure 1); and

a cathode (20) assembly, comprising:

a cathode (20) configured to emit the electron beam,

an X-ray detecting unit configured to detect the X-rays emitted from the X-ray tube and transmitted through the volume and to generate a detector output signal in response to the detected X-rays; an X-ray controller configured to operate the X-ray tube; a data acquisition system for receiving the detector output signal; an image reconstructor coupled to the data acquisition system for generating

an image signal in response to the detector output signal; and a computer for controlling the operation of at least one of the X-ray controller, the data acquisition system and the image reconstructor.

But Carlson ('477) fails to teach the cathode has an insulator isolating the cathode from ground potential (figure 1).

Chidester teaches an x-ray cathode insulator (40 or 70).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the x-ray tube of Carlson with the cathode insulator as taught by Chidester, since the insulator would reduce in voltage from the high voltage present at the anode and/or cathode to the much lower housing or ground potential (column 2 line 25-27).

Furthermore, Carlson ('477) fails to teach the bearings are duplex bearings.

Carlson ('340) teaches an x-ray target shaft support bearing system having at least two duplex bearings (78, figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the bearings of Carlson ('477) with the duplex bearing as taught by Carlson ('340), since duplex bearing would improve durability (column 4 line 58)

Regarding claims 3 and 9, Carlson ('477) teaches the insulator and the motor rotor system are located on the same side of the target (figure 2).

Regarding claims 6, 13 and 18, Carlson ('477) teaches the at least two bearing assemblies straddle the target (figure 2).

Regarding claim 8, Chidester teaches the insulator comprises a conical insulator (40).

Regarding claim 10, Carlson ('477) teaches the insulator is offset in a radial direction to the motor rotor system (figure 2).

Regarding claim 11, Carlson ('477) teaches a collimator (18) to direct the beam to the subject.

Regarding claim 12, Carlson ('477) teaches the at least two bearing assemblies distribute load substantially evenly (figure 2).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is (571) 272-2494. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272 - 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HKS

3/9/05
HKS

EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER